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**Notice of Allowability**

Application No.

10/092,711

Examiner

Joshua L. Pritchett

Applicant(s)

HARA ET AL.

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2872

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed September 16, 2005 and Interview on October 18, 2005.
2. ☒ The allowed claim(s) is/are 20 and 21.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                    |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|   | 9. <input type="checkbox"/> Other _____.   |

THONG NGUYEN  
PRIMARY EXAMINER  
GROUP 2500

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### EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Thomas Burton on October 19, 2005.

The application has been amended as follows:

20. A method for fabricating the micro-mirror which comprises [wherein further comprising the steps of]:

a mirror section for reflecting an incident light;

a hinge section including a fixed section and a movable section each having a flat surface;

a drive means having a bi-morph structure made of two or more materials having different heat expansion coefficient for deflecting said mirror section of a relative angle to said incident light; wherein

said hinge section and the mirror section are integrally constructed by a structured film formed on a semiconductor substrate by utilizing crystal anisotropy of said semiconductor substrate;

said movable section of the hinge section is formed as to be continuous from said fixed section of the hinge section and is formed so as to construct a bent slanting surface at an extended section of the fixed section of the hinge section;

comprising the steps of:

forming a first groove having a first skewed surface at a side wall on a front surface of said semiconductor substrate, and a second groove having a second skewed surface substantially parallel to said first skewed surface of the first groove at a position and opposite to a flat surface section around said first groove on a back surface of said semiconductor substrate;

forming structure films at said first skewed surface of the first groove and said flat surface section around said first groove;

forming a first drive film at one surface of said structured film;

forming said mirror section and said hinge section made of the structured film by removing said semiconductor substrate with etching process after performing a through-hole etching of said semiconductor substrate to make one end of said structured film to be a free end at a bottom section of said first groove [and];

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forming a second drive film on another surface of the structured film constructing said hinge section;

forming a metal film on said structured film constructing said mirror section and the hinge section; and

forming a reflection film and an electrode pad for supplying current to said reflection film by selectively etching said metal film.

The following is an examiner's statement of reasons for allowance:

Regarding claim 20, the prior art of record fails to teaches or suggest a bi-morph hinge section further comprising a metal film on the structured film constructing the mirror section and the hinge section and forming a reflection film and an electrode pad for supplying current to the reflection film by selectively etching the metal film.

Claim 21 depends from claim 20 and is allowable for the same reasons.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L. Pritchett whose telephone number is 571-272-2318.

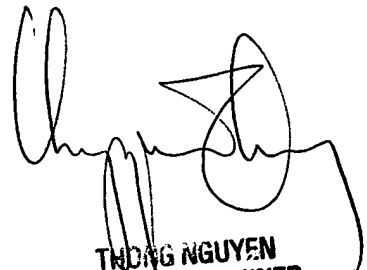
The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLP 



**THONG NGUYEN  
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